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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/010,525	12/06/2001	Robert S. Chau	042390.P4222D3	1842

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11/20/2002

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EXAMINER

VU, QUANG D

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 11/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

P.S.

Office Action Summary

Application No.

10/010,525

Applicant(s)

CHAU ET AL.

Examiner

Quang D Vu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08/20/02.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 30-35 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 30-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of group II, claims 30-35 in Paper No. 6 are acknowledged.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

2. Claims 30 and 31 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent No. 5,571,744 to Demirlioglu et al.

Regarding claim 30, Demirlioglu et al. (figures 1-12) teach a method of forming a semiconductor device comprising:

forming a gate electrode (26) having a first thickness on a gate dielectric layer (24) formed on a first surface of a substrate;

forming a pair of source/drain regions (46) on opposite sides of the gate electrode (26);

forming a silicon germanium film (36) having a second thickness on the gate electrode (26);

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forming a silicon germanium film (36) having the second thickness on the source/drain regions (46);

forming a silicide layer (50) having a third thickness on the silicon germanium films (36).

Regarding claim 31, Demirlioglu et al. teach forming a pair of sidewall spacers (30) having a first height above the substrate surface on opposite sides of the gate electrode (26), wherein the first height is greater than the sum of the first and second and third thicknesses (see figure 12).

3. Claims 33-35 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent No. 6,165,826 to Chau et al.

Regarding claim 33, Chau et al. (figures 5A-F) teach a method of forming a semiconductor device, comprising:

forming an isolation region (305) having a top surface in a semiconductor substrate (300);
etching the semiconductor substrate (300) adjacent to the isolation region (305) to form a recess region (520);

depositing a silicon germanium film (504) having a top surface in the recessed region (520); and

depositing a silicide layer (342) having a top surface over the silicon germanium film (504).

Regarding claim 34, Chau et al. teach the silicide layer (342) top surface extends above the isolation region (305) top surface (see figure 5F).

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Regarding claim 35, Chau et al. teach the silicon germanium film (504) top surface extends above the isolation region (305) top surface (see figures 5C-F).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 32 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,571,744 to Demirlioglu et al. in view of US Patent No. 5,168,072 to Moslehi.

Regarding claim 32, Demirlioglu et al. differ from the claimed invention by not showing the sidewall spacers (30) comprise silicon nitride. However, Moslehi teaches the sidewall spacers (60) comprise silicon nitride (figure 5; column 12, line 60 – column 13, line 5). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the teaching of Moslehi into the method taught by Demirlioglu et al., since the nitride spacer defines the dimensions of the gate and prevents impurities from coming directly into the channel. Additionally, it prevents any bridging between the source/drain regions and the gate.

Conclusion

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang D Vu whose telephone number is 703-305-3826. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

QVU
November 15, 2002

Steven Loke
Steven Loke